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### **LISTING OF THE CLAIMS:**

A listing of the entire set of claims is submitted herewith. The listing of claims replaces all prior versions, and listing of claims in the Application.

1-95. (Canceled)

96. (Previously Presented) An article comprising machine-readable media having encoded thereon software configured to cause a processor to:

receive a multiset of symbols in an inference engine, the symbols representing an initial hypothetical state of a biological system, wherein the symbols represent biological elements and said inference engine is for simulating at least one biological reaction;

iteratively substitute at least one of the symbols by at least another symbol using rules that represent interactions between the biological elements to detect based on the initial hypothetical state, a terminal state or alternative resultant states, wherein at least some of the rules are not terminating, and wherein one or more of the rules comprises an operator for expressing a relationship between at least two of the biological elements, the operator conforming to associative and commutative properties; and

provide an output comprising at least one of: the terminal state or at least one of the alternative resultant states, wherein the output is indicative of at least one of: a change in cell proliferation; a disease prediction, or a drug target identification.

97. (Canceled)

98. (Original) The article of claim 96 wherein one or more of the rules expresses concurrent state transitions.

99. (Canceled)

100. (Original) The article of claim 96 wherein at least one of the rules represents a feedback or feedforward interaction between biological elements.

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101. (Canceled)

102. (Original) The article of claim 96 wherein one or more of the symbols representing the biological elements is typed.

103. (Original) The article of claim 102 wherein the types of symbols are organized in hierarchical classes.

104. (Original) The article of claim 103 wherein a symbol for one of the hierarchical classes is matched by any symbol that is a member of the hierarchical class.

105-125. (Canceled)